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ABSTRACT

Developmental research, as opposed to simple instructional development, has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness. Developmental research is particularly important in the field of instructional technology. The most common types of developmental research involve situations in which the product-development process is analyzed and described, and the final product is evaluated. A second type of developmental research focuses more on the impact of the product on the learner or the organization. A third type of study is oriented toward a general analysis of design development or evaluation processes as a whole or as components. A fundamental distinction should be made between reports of actual developmental research (practice) and descriptions of design and development procedural models (theory). Although it has frequently been misunderstood, developmental research has contributed much to the growth of the field as a whole, often serving as a basis for model construction and theorizing. One figure illustrates the discussion. (Contains 24 references.) (SLD)

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Title:

Developmental Research: The Definition and Scope

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Developmental Research: The Definition and Scope[1]

The field of Instructional Technology has traditionally involved a unique blend of theory and practice. This blend is most obvious in developmental research which involves the production of knowledge based upon situation-specific problem solving. Developmental *research*, as opposed to simple instructional development, has been defined as "the systematic study of designing, developing and evaluating instructional programs, processes and products that must meet the criteria of internal consistency and effectiveness" (Seels and Richey, in press). In its simplest form, developmental research could be either:

> a situation in which someone is *performing* instructional design, development, or evaluation activities and *studying* the process at the same time; **or**
>
> the study of the impact of someone else's instructional design and development efforts; **or**
>
> the study of the instructional design, development, and evaluation process as a whole, or of particular process components.

In each case the distinction is made between performing a process and studying that process. Reports of developmental research may take the form of a case study, an evaluation report, a retrospective analysis, or even that of a typical experimental research report. Today, even amid the calls for increased use of alternative research methodologies, the notion of instructional development as a research methodology is unclear, not only to the broader community of educational researchers, but to many Instructional Technology researchers as well.

The Background of Developmental Research

The field of Instructional Technology as it exists today emerged from a convergence of the fields of audiovisual education and instructional psychology. In audiovisual education the emphasis was upon the role of media as an enhancement of the teaching/learning process and an aid in the communication process, and there was much interest in materials production. On the other hand, in instructional psychology the nature of the learner and the learning process took precedence over the nature of the delivery methodology, and there was much interest in instructional design. Complementing the instructional psychology roots was the application of systems theory to instruction which resulted in the instructional systems design movement (Seels and Richey, in press). This conceptual and professional merger came to fruition in the 1960's and 1970's. During this period instructional design and development came to assume the role of the "linking science" that John Dewey had called for at the turn of the century (Reigeluth, 1983).

Not surprisingly, it was during this same period that development emerged as a research endeavor. This change was exemplified by the shift in topics between the First and

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[1]This paper is excerpted from "Developmental Research" a chapter by Rita Richey, Philip Doughty, and Wayne Nelson which will be published in the forthcoming Handbook of Research on Educational Communications and Technology edited by David H. Jonassen.

Second Handbooks of Research on Teaching (Gage, 1963; Travers, 1973). In the 1963 handbook, media was addressed as an area of research, and all research methodologies considered were quantitative. In the 1973 handbook, media continued to be included as a research area, but the research methodologies were varied, including Eva Baker's chapter on "The Technology of Instructional Development". This chapter describes in detail the process of systematic product design, development, and evaluation. Of significance is the fact that the entire methodology section was titled "Methods and Techniques of Research *and Development*".

This was a period in which federal support of educational research mushroomed. Regional research and development laboratories were established and the ERIC system was devised for dissemination. Clifford (1973) estimated that appropriations for educational "research and development for 1966 through 1968 alone equaled three-fourths of all funds ever made available" (p. 1). Research-based product and program development had become firmly established as part of the scientific movement in education. At this time, Wittrock (1967) had the use of empirical measurement and experimentation to explain product effectiveness. Such activities "could change the development of products into research with empirical results and theory generalizable to new problems" (p. 148).

Hilgard (1964) characterized research as a continuum from basic research on topics not directly relevant to learning through the advocacy and adoption stages of technological development. Saettler (1990) maintained that the last three of Hilgard's research categories were directly within the domain of Instructional Technology. These included laboratory, classroom and special teacher research; tryout in "normal" classrooms; and advocacy and adoption. Note that these are portrayed as types of research, rather than applications of research, and they are all encompassed within the framework of developmental research.

While Instructional Technology is not the only field concerned with learning in applied settings, few would dispute the critical role played by these three types of research in our field. Moreover, our uniqueness among educational fields is not only our concern with technology, but rather our emphasis upon the design, development, and use of processes and resources for learning (Seels and Richey, in press). Given this definition of the field, developmental research is critically important to the evolution of the field's theory base.

The Character of Developmental Research

The distinctions between "doing" and "studying" design and development provide further clarification of development as a research activity. These distinctions can be described in terms of examining the focus, techniques, and tools of developmental research.

The Focus of Developmental Research. The general purposes of research have been described as knowledge production, understanding and prediction. Within this framework, developmental research has particular emphases which vary in terms of the extent to which the conclusions are generalizable or contextually-specific. Figure 1 portrays the relationships among the various types of developmental research.

The most common developmental research projects fall into the first category of Figure 1. This category typically involves situations in which the product development process is analyzed, described, and the final product is evaluated, such as Buch's (1987) documentation of the development of an industrial microcomputer training program. Driscoll (1991) called this research paradigm systems-based evaluation. Some Type 1 developmental studies reflect traditional evaluation orientations in which the development process is not addressed, and only the product or program evaluation is described. An

example of this type of study is O'Quin, Kinsey, and Beery's (1987) report of the evaluation of a micro-computer training workshop for college personnel. Regardless of the nature of the Type 1 study, the results are typically context and product specific, even though the implications for similar situations may be discussed.

FIGURE 1
A Summary of the Types
of Developmental Research

DEVELOPMENTAL RESEARCH		
Type 1	**Type 2**	**Type 3**
Description or Analysis of Product or Program Design, Development & Evaluation	Description or Analysis of Product or Program Utilization & Impact Evaluation	Study or Improvement of the Design, Development & Evaluation Process or Components
(Study of Specific Products or Contexts)	(Study of Extended Impact of Product or Program on Organization Change &/or Learner Growth)	(Design, Development, & Evaluation Procedural Model Development)
Context-Specific Conclusions		**Generalized Conclusions**

The focus of Type 2 developmental research is not so much upon the development of products, but more upon the impact of that product upon the learner or the **Figure 1** organization. Using Kirkpatrick's (1983) categories of evaluation outcomes, these studies typically do not address only participant satisfaction or evidence of learning, but tend to consider behavior or skill application and organizational impact. They address product or program effectiveness on a broader scale, such as Smith's (1993) comprehensive study of five years of executive development. Type 2 studies may employ confirmative evaluation procedures. This typically involves an evaluation as a part of a summative study and is designed to determine the continuing competence of learners or the continuing effectiveness of instructional materials (Hellebrandt and Russell, 1993). Type 2 studies also attend to program implementation and maintenance issues. One example, of this latter focus is the case study of cost-effectiveness evaluation described by Klein and Doughty (1980). Their conclusions, as is typical of a Level 2 study, are context-specific, but they also suggest general principles for cost-effectiveness evaluation procedures which can be used in a variety of design and development projects. In this respect, the study approaches the purposes of a

Type 3 developmental research project.

The third type of study is oriented toward a general analysis of either design development or evaluation processes as a whole or any particular component. They are similar to those studies Driscoll (1991) calls model development and technique development research. While there are fewer studies that focus on the more global orientation, Taylor and Ellis's (1991) study did so by evaluating the use of instructional systems design in the Navy and Kress (1987) did so by comparing the impact of systematically designed training with a non-systematic approach. Other studies in this category focus upon only one phase of the design/development/evaluation process, such as Jonassen's (1988) case study of using needs assessment data in the development of a university program. Type 3 research may draw its population from either one target
project such as King and Dille's (1993) study of the application of quality concepts in the systematic design of instruction at the Motorola Training and Education Center, or from a variety of design and development environments. Examples of the latter approach include Riplinger's (1985) survey of current task analysis procedures, and Cambre's (1978) historical study of formative evaluation in instructional film and television. Typically, conclusions from Type 3 developmental research are generalized, even though there are instances of context specific conclusions in the literature.

Non-developmental Research in the Field. A critical aspect of any concept definition is the identification of non-examples as well as examples. This is especially important with respect to developmental research since it often seems to overlap with other key methodologies used in the field. Even so, developmental research does *not* encompass studies such as the following:

instructional psychology studies;
media or delivery system comparison or impact studies;
message design and communication studies;
policy analysis or formation studies; and
research on the profession.

While results from research in these areas impact the development process, the study of these variables does not constitute developmental research. For example, design and development is dependent upon what we know about the learning process. We have learned from the research literature that transfer of training is impacted by motivation, organizational climate, and previous educational experiences. Therefore, one may expand a front-end analysis to address such issues, or even construct design models which reflect this information, but the foundational research would not be considered developmental. If the new models were tested, or programs evaluated which were designed using such models, this research would qualify as developmental.

A fundamental distinction should be made between reports of actual developmental research, and descriptions of design and development procedural models. While these models may represent a synthesis of the research, they do not constitute research in themselves. A good example of this latter situation is Park and Hannafin's (1993) guidelines for designing interactive multimedia. These guidelines are generalized principles which speak to the development process, and they are based upon a large body of research. Nonetheless, the identification and explanation of the guidelines is not in itself an example of developmental research. The Instructional Technology literature includes many examples of such work. They often provide the stimulus for a line of new research, even though these articles themselves are not considered to be research reports themselves. There are many examples today of such work, including explorations of topics such as cognitive task analysis (Ryder and Redding, 1993), or the nature of design and designer decision making (Rowland, 1993).

The Techniques and Tools of Developmental Research. Developmental researchers employ a variety of research methodologies, applying any tool which meets their requirements. Summative evaluation studies often employ classical experimental designs. Needs assessments may incorporate qualitative approaches. Process studies may adopt descriptive survey methods. Even historical research methods may be used in developmental projects.

Traditional research tools and traditional design tools facilitate the developmental endeavor. Expertise is often required in statistical analysis, measurement theory, and methods of establishing internal and external validity. Likewise, the developmental researcher (even those studying previously designed instruction) requires a command of design techniques and theory. Additional design proficiency is frequently required when using electronic design systems and aids, conducting environmental analyses, and defining ways to decrease design cycle time.

A developmental research project may include several distinct stages, each of which involves reporting and analyzing a data set. Merely conducting a comprehensive design and development project does not constitute conducting a developmental research project even using its most narrow Type 1 definition. One must also include the analysis and reporting stage to warrant being classified as developmental research.

Developmental research projects may include a number of component parts. Sub-studies may be conducted to analyze and define the instructional problem, to specify the content, or to determine instrument reliability and validity. Sub-studies may be conducted to provide a formative evaluation, a summative evaluation, or a follow-up of post-instruction performance. Consequently, reports of developmental research are frequently quite long, often prohibiting publication of the full study.

Reports of developmental projects can often be found in:

professional journals;
doctoral dissertations;
Educational Resource Information Center (ERIC) collections of unpublished project reports; and
conference proceedings.

The nature of the reports vary depending upon the dissemination vehicle. Sometimes, full developmental projects are split into more easily publishable units (or even summarized) to facilitate publication in the traditional research journals. Developmental research reports are also published in practitioner-oriented journals and magazines, and the methodology and theoretical base of the studies is omitted to conform to the traditions of those periodicals.

Conclusion

Developmental research, even though frequently misunderstood, has contributed much to the development of the field as a whole. It often serves as a vehicle for dissemination of model techniques and processes, especially as new technologies, new procedural changes, new programmatic trends emerge. Moreover, developmental research can provide a basis for both model construction and theorizing, one which is rooted in the experiences of practitioners as well as researchers.

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